

## CHAPTER 9

# FACILITIES MAINTENANCE MANAGEMENT

*LEARNING OBJECTIVE: Identify the advantages of having a maintenance program. Recognize and maintain various standard forms used in a maintenance management program. Analyze benefits of a maintenance/cost control program.*

Maintenance is the function of keeping buildings, structures, grounds, and equipment in (or restoring them to) a serviceable condition. Inspection and maintenance should be used to get maximum use of existing equipment and facilities at minimum cost. Set specific levels of maintenance for each facility. The level of maintenance established depends on the mission of the activity and the projected life span of the facility. By knowing the maintenance management system, you are able to approach the goal of maximum usage and minimum cost.

### MAINTENANCE MANAGEMENT

In the past, both industry and government ignored maintenance management while extensively analyzing and controlling production needs. Then labor costs increased dramatically and indirect costs soared higher than anyone expected. These cost increases encouraged the birth of the maintenance management system. The Naval Facilities Engineering Command established the maintenance management system in the mid- 1950s to control these spiraling maintenance costs.

### OBJECTIVE AND PURPOSE

The basic goal of the maintenance management system is to best use available resources: manpower, equipment, materials, and money. This system provides the framework to place decision making where the analysis of Public Works operations occur. Each Public Works functional area has information that affects the maintenance requirements. For example, the shop feels that connecting a certain deficiency, such as replacing a roof, is necessary. However, because of funding limitations, only a temporary repair is authorized to correct a more serious deficiency elsewhere.

An effective management system assures achievement of the following goals:

- Use of activities resources in the most efficient manner.
- Performance of maintenance based on a schedule instead of breakdown.
- Provide direct control over the maintenance work force performance.
- Performance of the proper level of maintenance.
- Take corrective action before major repairs are required.
- Reduce administrative details that interfere with the direct supervision of the work force.
- Correlate the work center capacity with its work load.
- Obtain optimum shop force alignment by trade skills.
- Provide information that shows trouble areas needing corrective action.
- Provide basis for comparing the cost estimates with the actual cost of maintenance.

### SPAN OF CONTROL

Reducing maintenance control procedures to a simple manual of operations that meets every condition is not possible. Nor can you replace the need for individual judgment and discretion. Placing too much emphasis upon having written procedures for achieving conformity, uniformity, or standardization causes a person to lose sight of the main goal. **Increasing the productivity of the maintenance work force is a**

Table 9-1.—Elements of Control for a Maintenance Management System

ELEMENTS	FUNCTIONS
(1) Inventory (2) Maintenance standards	These two elements are the foundation of the Maintenance Management System. They provide information on what is to be maintained and comprise a basis for evaluating (a) the condition of shore facilities and (b) the effectiveness of part or all of the maintenance effort.
(3) Work classification (4) Numerical identification for reporting	These are controls that channel and identify work documents and work accomplishment.
(5) Work generation (6) Work reception (7) Work input control (8) Planning and estimating (9) Job authorization	Functional controls applied to all processing except that provided in direct support of work performance.
(10) Material coordination (11) Shop scheduling	Controls in direct support of work performance before, and during, the course of the job.
(12) Reports (13) Appraisal	Controls designed to assist management in making judgements and decisions and in taking necessary corrective action during job progress and after completion.

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primary benefit of the maintenance management system. Any prescribed procedures or reports should just be tools to help attain this goal. Table 9-1 shows the 13 key elements of control that make up the maintenance management system. If these elements are managed properly, you will have an effective and efficient Public Works organization. For a complete description of the maintenance management system, refer to the *Maintenance Management of Shore Facilities*, NAVFAC MO-321.

Two levels of control exist for this system: complete and modified. Complete control exists when using all the methods and procedures described in NAVFAC MO-321. Exercising modified control occurs when the activities vary from the prescribed methods and procedures. This action does not replace the elements of control. Instead, modified control should show differences in control elements caused by the size of an activity, work load, and any local conditions. Most small activities use some form of modified control.

## SYSTEM ELEMENTS

In the maintenance management system, there are five key elements.

1. Work generation consists of operator inspections, preventive maintenance inspections (for nonoperator equipment), and control inspections for all the facilities and equipment. *The Inspection of Shore Facilities*, NAVFAC MO-322, outlines the frequency of continuous inspections. Work generation also includes observations by tenants and military inspections.

2. Work input control provides basic planning and status information control on the work. It includes screening individual jobs for need, deciding their priority, programming them through the planning phase, and authorizing the work. It also includes maintaining a balanced and adequate workload for each work center, assuring proper completion of the jobs, and keeping informed on the status of the jobs.

3. Planning and estimating provides labor and material cost estimates and a task performance

sequence that allows for proper management control and follow-up.

4. Shop scheduling provides the framework for maximum coordination between various shop crafts and helps reduce the delays caused by the lack of materials, equipment, and transportation.

5. Management reporting provides the Public Works managers with reliable and useful information on performance and manpower distribution. This information is useful for planning, decision making, and reviewing goals.

## ORGANIZATION AND STAFFING

Setting up a maintenance management system provides the Public Works Departments (PWDs) with an effective tool for managing both productivity and the resources available. To help you better understand the elements of control for the maintenance management system (table 9-1), let's review the organizational structure (or staffing) of a PWD.

### PUBLIC WORKS DEPARTMENT

Figure 9-1 shows the recommended organization for a small PWD. As a chief petty officer, you may be assigned to overseas activities, security activities, or remote activities within the United States. At these locations you could perform the functions of either the shop's engineer or the assistant public works officer.

### Public Works Officer

The public works officer (PWO), a Civil Engineer Corps officer, is responsible to the commanding officer of the base or activity for organizing, managing, and supervising the PWD. The PWO's areas of responsibility include the shops, the facilities, and the personnel assigned to the PWD. The PWO is responsible for the planning, designing, maintaining, and repairing of facilities. He or she is also responsible for all the safety certifications, energy conservation programs, and environmental matters. He or she may also be responsible for all the facility support contracts.

### Administrative Division

The Administrative Division is responsible for all matters regarding civilian personnel, office services, reports and statistics, financial management, and management analysis.

### Family Housing Division

Each installation that has family housing must have a centralized family housing office. To centralize the responsibilities for family housing management, you will normally have a Family Housing Division within each PWD. The Family Housing Division has two responsibilities: housing management and housing referral.

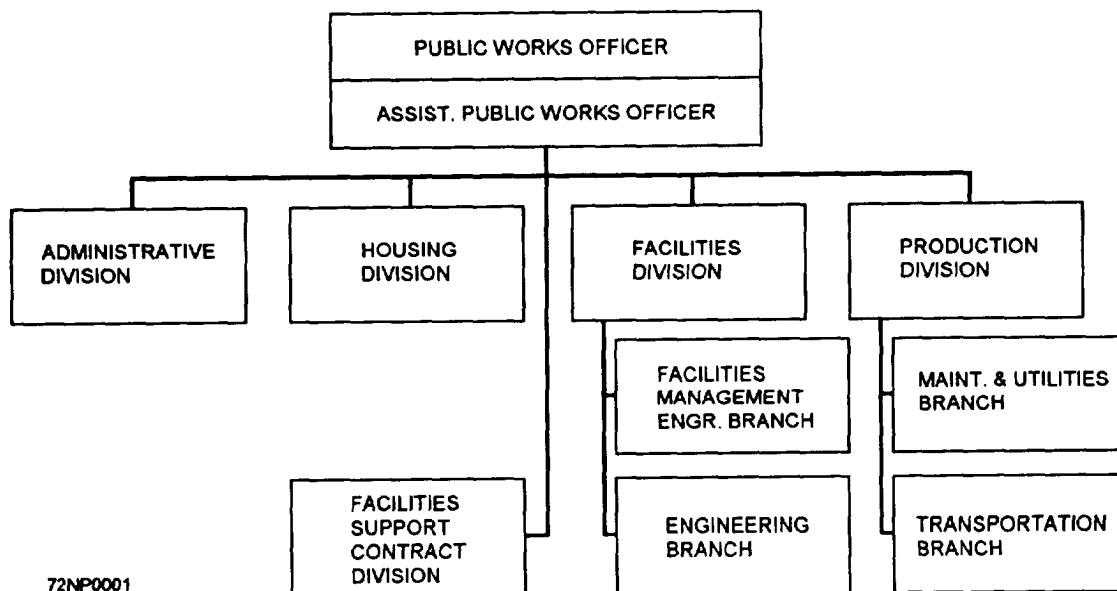


Figure 9-1.—Standard organization for a small PWD.

## Facilities Division

The Facilities Division consists of two branches. These branches are the Engineering Branch and the Facilities Management Engineering Branch.

A energy resources management position might also exist in the Facilities Division due to its close association with facilities design and project preparation. This division also has the best technical support available for this program.

**ENGINEERING BRANCH.**— The Engineering Branch is responsible for all the engineering services. The duties include preparing engineering studies, preliminary designs, estimates, performing field engineering, and maintaining the technical files and records.

**FACILITIES MANAGEMENT ENGINEERING BRANCH (FME).**— The Facilities Management Engineering Branch is the only branch in the PWD that directs its entire effort toward maintenance management. FME is responsible for performing control inspections, screening and classifying all the work requests, and preparing material and labor estimates for job orders. FME also prepares preliminary estimates before submitting them to the Engineering Branch for action. The branch also performs the master shop scheduling, maintains the status of inspection reports, tracks work requests from receipt to completion or cancellation, and manages all maintenance service contracts.

## Production Division

The Productions Division has three branches. These branches are the Maintenance Branch, Utilities Branch, and the Transportation Branch. Under normal conditions, a PWD with less than 75 personnel in the Maintenance and Utilities Branches would normally combine these two branches into a single branch. The elements of the Production Division varies with the types and sizes of the activities. For example, the variety of crafts and shops in a PWD at a communications station will be less than that at an industrial activity, such as a shipyard.

The Production Division is responsible for performing preventive maintenance inspections, for maintaining all the camp facilities, and for doing emergency service (E/S) work.

**MAINTENANCE AND UTILITIES BRANCH.**— The maintenance section is responsible for preventive maintenance inspections, maintenance of

all the shore facilities, and performing emergency or routine service work. The utilities section is responsible for equipment operation in producing utilities. The utilities section performs operator inspections, preventive maintenance inspections on the utilities, as well as, doing E/S work on utilities.

**TRANSPORTATION BRANCH.**— The transportation branch provides transportation and construction equipment and equipment operators to all the departments of the activity. This branch also maintains and repairs all the transportation equipment. The performance of this branch is guided by the *Management of Transportation Equipment*, NAVFAC P-300.

## WORK GENERATION

Maintenance work can start with customer requests and command inspections. However, the preferred way is by members of the PWD through the continuous shore facilities inspections system. The maintenance manager must know what facilities he or she is responsible for maintaining to run an effective continuous inspections system. Thus verifying an inventory of all the facilities is an important part of the foundation of maintenance management.

## INVENTORY

A maintenance manager must know what facilities he or she is responsible for maintaining. The manager must know how many facilities, their location, and their mission. The Facilities Management Engineering (FME) Branch collects all this information for each facility. History files of the facility retain this information. By knowing the history of each facility, the FME personnel decide where to apply available maintenance funds.

Take the information for these inventory records from activity plant account records, as-built drawings, and completed job orders. These records may not contain all the essential information about the amount and types of electrical and mechanical systems and related equipment contained in the individual facilities. Therefore, you may need to survey all the facilities to complete the inventory. The information collected forms the basis for the Shore Facilities Inspection System and for planning maintenance requirements. The Shore Facilities Inspection System becomes the basis for developing a preventive maintenance program.

Failing to track the inventory for maintenance (and later the schedule) causes the inventory to become outdated. For example, properly listing new buildings and deleting demolished structures does not occur. As a result, the picture that you and higher authorities have of your inventory becomes distorted. The inventory, with the maintenance backlog, is the primary basis for fund allocation at the claimant level. The accuracy of your inventory is essential. Not properly documenting the inventory can jeopardize the shore facilities planning cycle. It also can result in fewer operation and maintenance (O&M) dollars for maintenance. These problems could exaggerate unit cost data for maintenance. In addition, an inaccurate inventory makes a logical schedule unlikely.

## **CUSTOMER REQUESTS**

A work request can start as either a written request or a telephone call to the work reception desk. Figure 9-2 shows a typical written work request. Usually, any work requested by a customer that will take longer than a service call (more than 16 man-hours) should be submitted on a Work Request, NAVFAC Form 9-11014/20. The FME director screens and approves work requests for funding. The director forwards all approved work requests to the maintenance control branch for both estimating and scheduling.

## **CONTINUOUS INSPECTIONS SYSTEM**

The purpose of the continuous inspections system is to identify deficiencies in shore facilities. This program also starts corrective actions needed to bring these facilities up to the desired maintenance standard.

You should inspect all facilities by the intervals outlined in NAVFAC MO-322. You must blend the continuous inspections completely into the maintenance management system. The major work load of the PWD is driven by continuous inspections, rather than by a one-time comprehensive inspection or by breakdown reports.

The three major parts of the continuous inspection system are operator inspections, preventive maintenance inspections, and control inspections.

### **Operator Inspections**

The person assigned to operate the equipment or system is responsible for performing the operator inspections. These inspections include pre-operation checks, simple lubrication, and minor adjustments of

the equipment or system. The operator should post detailed instructions either on the equipment or in the watch log.

The operator should report breakdowns and deficiencies beyond his or her capacity or authority immediately to the supervisor. The inspection branch reviews these reported deficiencies and begins further action if required. The branch rates the effectiveness of the operator's inspections at the time of control inspections.

## **Preventive Maintenance Inspections**

Preventive maintenance inspections (PMIs) are similar to operator inspections except the equipment has no specific operator. PMIs concern items that, if disabled, would do the following:

- Interfere with an essential operation of the naval activity.
- Endanger life or property.
- Involve high cost or long-lead time for replacement.

PMIs should be performed by shop personnel. The frequency of these inspections should be based on Navy publications, manufacturers' brochures, and, most importantly, shop personnel advice and experience.

## **Control Inspections**

A control inspection is a scheduled examination of facilities by Public Works inspectors to learn the physical condition using uniform maintenance standards. The goals of control inspections are as follows:

1. Provide periodic examination of all shore facility items not covered by operator inspection or PMI.
2. Assure the adequacy of operator inspection and PMI.
3. Reduce the number of breakdowns and cost of repairs.
4. Provide a balanced flow of work to the shops.
5. Detect and reduce overmaintenance.
6. Allow improved planning for the best utilization of the labor force and material requirements.

<b>WORK REQUEST (MAINTENANCE MANAGEMENT)</b> <small>NAVFAC 9-11014/20 (REV. 2-88) 5/M-8185-002-7518  Supersedes NAVDOCK 3 2351</small> MS SANS SERIF 20 BOLD		<small>(PW Department use instructions in NAVFAC MO-331)</small>
<small>Requester use instructions on Reverse Side</small>		
<b>PART I - REQUEST (Filled out by Requestor)</b>		
1. FROM <div style="border: 1px solid black; padding: 2px;">RESEARCH DIVISION</div>	2. REQUEST NO. <div style="border: 1px solid black; padding: 2px;">50 - 001 - 94</div>	
3. TO <div style="border: 1px solid black; padding: 2px;">PUBLIC WORKS DEPARTMENT</div>	4. DATE OF REQUEST <div style="border: 1px solid black; padding: 2px;">7/6/94</div>	
5. REQUEST FOR <input checked="" type="checkbox"/> COST ESTIMATE <input type="checkbox"/> PERFORMANCE OF WORK		5a. REQUEST WORK START
6. FOR FURTHER INFORMATION CALL <div style="border: 1px solid black; padding: 2px;">JOHN DOE EXT. 419</div>		7. SKETCH / PLAN ATTACHED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
8. DESCRIPTION OF WORK AND JUSTIFICATION <small>(Including location, type, size, quantity, etc.)</small> <div style="border: 1px solid black; padding: 10px; min-height: 150px;"> PARTITION OFF ROOM IN BUILDING NO. 14 FOR OFFICE SPACE </div>		
9. FUNDS CHARGEABLE		10. SIGNATURE <small>(Representing Official)</small> <div style="border: 1px solid black; padding: 2px;">(signed) JACK JONES</div>
<b>PART II - COST ESTIMATE</b> <small>(Filled out by Maintenance Control Division if estimate requested)</small>		
11. TO <div style="border: 1px solid black; padding: 2px;">RESEARCH DIVISION</div>		12. ESTIMATE NO. <div style="border: 1px solid black; padding: 2px;">80734</div>
13. COST ESTIMATE		14. SKETCH / PLAN ATTACHED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
a. Labor <div style="border: 1px solid black; padding: 2px;">\$ 1,380</div>	15. <input checked="" type="checkbox"/> APPROVED PROGRAMMING TO START IN <div style="border: 1px solid black; padding: 2px;">Based on priority by computer.</div>	
b. Material <div style="border: 1px solid black; padding: 2px;">\$ 2,490</div>	<input type="checkbox"/> APPROVED BASED ON PRESENT WORKLOAD, THIS JOB CAN BE PROGRAMMED TO START IN _____ IF	
c. Overhead and / or Surcharge <div style="border: 1px solid black; padding: 2px;">\$ 400</div>	AUTHORIZED BY 25TH OF _____ AND FUNDS ARE MADE AVAILABLE	
d. Equipment Rental / Usage <div style="border: 1px solid black; padding: 2px;">\$ _____</div>	<input type="checkbox"/> DISAPPROVED <small>(See Reverse Side)</small>	
e. Contingency <div style="border: 1px solid black; padding: 2px;">\$ 854</div>	16. SIGNATURE <div style="border: 1px solid black; padding: 2px;">(signed) JOHN SMITH</div>	
f. TOTAL <div style="border: 1px solid black; padding: 2px;">\$ 5,124</div>	17. DATE <div style="border: 1px solid black; padding: 2px;">7/6/94</div>	
<b>PART III - ACTION (Filled out by Requestor)</b>		
18. TO		19. AUTHORIZATION TO PROCEED IS ATTACHED <small>(Check one if other than PW funds are involved)</small> <input type="checkbox"/> NAVCOMPT 148 <input type="checkbox"/> OTHER
20. WORK REQUESTED <input type="checkbox"/> HAS BEEN CANCELLED <input type="checkbox"/> HAS BEEN DEFERRED <input type="checkbox"/> WILL BE PERFORMED BY OTHERS		21. SIGNATURE
22. DATE		
<small>(See Part IV on Reverse Side)</small>		

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Figure 9-2.—Work Request (Maintenance Management), NAVFAC 9-11014/20.

Personnel assigned to the inspections branch perform control inspections, or other personnel at the request of the inspections branch may perform them. Control inspectors do not adjust equipment but report any deficiencies to the manager of the inspection branch.

Structural, mechanical, and electrical inspections are divisions of control inspections. Figure 9-3 shows a typical Inspector's Report, NAVFAC 11014/38. Emergency/service and minor work requirements should also be noted on the report. NAVFAC MO-321

and NAVFAC MO-322 contain detailed guidance on operating the Shore Facilities Inspection System. The successful operation of a continuous inspection system depends upon an up-to-date inventory of facilities and the use of uniform maintenance standards.

## WORK CLASSIFICATION

Six classifications for work are used at Public Works. Those categories are emergency work, service work, minor work, specific jobs, standing jobs, and rework.

INSPECTOR'S REPORT NAVFAC 11014/38 (REV. 9-72) NPN 9195 - 888 - 7882		Instructions for completing form are contained in NAVFAC MO-322, Vol. I						<input type="checkbox"/> DE 15 <input checked="" type="checkbox"/> CONTROL INSPECTION																																														
1. FACILITY NO. <b>VARIOUS</b>	2. COST ACCOUNT NO. <b>7160</b>	3. FAC. <b>4</b>	4. CATEGORY CODE <b>61010</b>	5. FUNCT. ACCT. NO.	6. FOC <b>A</b>	7. DATE SCHED. <b>4-85</b> ACT <b>4-19-85</b>	8. MGA INSPECTION INITIAL <b>JK</b> DATE <b>4-25-85</b>																																															
9. DESCRIPTION AND LOCATION <b>Admin Bldgs Various Locations</b>																																																						
10. INSPECTOR <b>U.L. Crawl &amp; H.E. SNOOPS</b>						11. INSPECTION TIME USED <b>16 hrs</b>		12. SHEET NO. <b>1 of 7</b>																																														
13. DESCRIPTION OF ITEM AND DEFICIENCY																																																						
<table border="1"> <tr> <td><b>BLDG. #2</b></td> <td><b>Structural Repairs and painting</b></td> <td><b>\$160</b></td> </tr> <tr> <td>" #4</td> <td>No deficiencies 4-17-85</td> <td></td> </tr> <tr> <td>" #5</td> <td>No deficiencies 4-18-85</td> <td></td> </tr> <tr> <td>" #6</td> <td>Repairs to roof, plaster &amp; repaint</td> <td><b>\$780</b></td> </tr> <tr> <td>" #7</td> <td>Replace rear entrance stairs and landing</td> <td><b>\$500</b></td> </tr> <tr> <td>" #9</td> <td>No deficiencies 4-24-85</td> <td></td> </tr> <tr> <td>" #10</td> <td>Replace 16 floor joists ROOM. 10</td> <td><b>\$460</b></td> </tr> <tr> <td>" #13</td> <td>Repair counter doors &amp; Replace broken glass</td> <td><b>\$232</b></td> </tr> </table>										<b>BLDG. #2</b>	<b>Structural Repairs and painting</b>	<b>\$160</b>	" #4	No deficiencies 4-17-85		" #5	No deficiencies 4-18-85		" #6	Repairs to roof, plaster & repaint	<b>\$780</b>	" #7	Replace rear entrance stairs and landing	<b>\$500</b>	" #9	No deficiencies 4-24-85		" #10	Replace 16 floor joists ROOM. 10	<b>\$460</b>	" #13	Repair counter doors & Replace broken glass	<b>\$232</b>																					
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Figure 9-3.—Inspector's Report NAVFAC 11014/38.

All the work goes through an initial process of classification and screening at the work reception desk or trouble desk. During this step, the work reception desk personnel identify emergency jobs for immediate issue to the proper work center. The work left after this initial screening should be of a routine nature but may be of greater scope than a service call. He or she also assures customers submit routine work in a written work request and forwards the request to the FME director.

When the balance of work requires more than a service call, it falls into the maintenance and repair work categories. Those categories are minor, specific, or standing work orders and requests for minor construction and improvements.

### **EMERGENCY/SERVICE (E/S) WORK**

Authorization of work is relative to the degree of control required. Small work items of a one-time nature, such as changing light bulbs or making minor repairs to facilities, plumbing, or electrical wiring and fixtures, require little detailed management control. When these small jobs do not relate to a utility system that is down or an essential service, these jobs are routine service work. When these jobs restore essential services, they are emergency service (E/S) work. Authorization of E/S work is on an Emergency/Service Work Authorization (ESA), NAVFAC Form 11014/21 (fig. 9-4), and issued to the shops for completion. Use E/S work authorizations for small work items that take up to 16 man-hours and do not exceed the established limit for material cost.

To reduce the paper work involved in P&E and cost accounting, NAVCOMPT has established cost account numbers for E/S work. This type of work does not need to be charged against the account of the facility receiving the WS work. The exception to this is charging EN work accomplished on family housing to the proper type of housing.

The only detailed management control used by PWD for HS work requires the worker to note both the start and stop times on the ESA. This is done to find out the total man-hours involved in completing the job. Periodic review of service calls often identifies potentially large problem areas that need correcting by either a major overhaul, a replacement, or a change of the equipment used.

### **MINOR WORK**

Classify jobs that range from 16 to 80 man-hours and cost less than the established material limit. Minor work is planned and estimated by using the Engineered Performance Standards (EPS), when applicable. Costs are not collected for individual jobs. These costs are accumulated against a job order number or cost account. This means less paper work for the comptroller and the FME Branch. However, if full-job accounting is received, the work cannot be classified as minor work.

### **SPECIFIC JOB ORDERS**

Write specific job orders to cover work where you want individual job costs for financial and performance evaluation, such as work performed for a tenant activity. Use specific job orders for work that takes more than 80 man-hours to complete. These job orders are also used to provide information for total Public Works planning and to send information to the shops. Charge all the work performed on specific job orders against the proper account according to the actual hours charged by the shops. No additional work should be done on specific job orders without prior approval. When the job order requires additional work, provide an estimate based on the new requirements. An example of a specific job is the repair of deteriorated roofing on a warehouse.

### **STANDING JOB ORDERS**

There are also job orders that are more than 40 man-hours which, because of their repetitive nature, you process as standing job orders.

There are two types of standing job orders: estimated and unestimated.

1. Estimated. Examples of estimated work include janitorial service, trash and garbage disposal, and power plant watch standing. Estimated standing job orders should include an exact work description, a clearly specified frequency cycle, and accurate time and cost estimates. It is useful to develop realistic labor and material estimates for these repetitive functions, based on EPS, when available, and jobsite analysis. Normally, issue estimated standing job orders quarterly.

2. Unestimated. Normally, issue unestimated standing job orders annually. These job orders are usually service work. Issue these job orders primarily as fiscal documents for collecting total annual charges. An example of an unestimated standing job order would be snow removal. Since no one knows how much snow



## NAVJAG 11014 /21 (Rev. 8-75)

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will fall during the year, the costs collected against the job order will not be known until the end of winter.

Do not use a standing job order to authorize a specific task that is service work in nature. For instance, do not write individual standing job orders for replacing window glass, replacing light bulbs, making emergency repairs, or repairing plumbing leaks.

You should review all the standing job orders periodically to determine the requirement of the work authorized and completeness of the specification of the

work involved. You should also review for proper frequency of work performed, reasons for man-hours estimate and work performance variation, and total maintenance force labor requirements.

## WORK ASSIGNMENT PRIORITIES

Priority assignment of jobs is essential in deciding the importance of each job in relation to other requirements. Manpower and funding limitations may not allow the PWD to do all the necessary and desired

work at the time of the work identification. With a priority classification system, you can get the most use from your resources. Assigning a priority designator provides you with an adequate definition of the importance of each job.

You can express the importance of various functions and types of work by assigning priorities using a matrix (table 9-2). After initial use of the priority matrix, review the results periodically and revise priorities, as necessary. The with the highest priority (lowest number) will precede others of lower priority on the schedule.

The priority matrix lists work classifications shown below.

- **Safety.** Work required primarily for safety reasons.

- **Function.** Work primarily identified with the mission of the activity.

- **Preventive.** Work primarily required to prevent significant deterioration of the plant property or equipment caused by continued use or from natural forces.

- **Appearance.** Work done primarily for preserving or upgrading the appearance of a facility.

Each of these work classifications has three levels of importance. You base the importance level of a particular job on its impact on other jobs in the same classification.

1. High.

2. Routine. Most work falls into this category.

3. Low.

The PWO or the APWO must give approval for assignment of priority 1 to work. This priority states an overriding emergency, or urgent priority. This priority is an overriding requirement that will insert the final estimated work into the schedule at any point.

## JOB ORDER CLASSIFICATIONS

Every specific and standing job order must have a job order number. The *Navy Comptroller Manual* says that you should keep the number of digits in a job order to the minimum required. This will reduce the chance of error and save time in writing the job order number or expenditure documents and in sorting such documents. This statement also applies when entering job order numbers on the labor job time cards, material requests, and other expenditure documents. For maintainarm management purposes, more than seven digits are cumbersome. The *Navy Comptroller Manual* states in part:

“No Navy-wide plan of numbering job orders is prescribed because of the variations of requirements in the various naval activities. . . . Generally, all that is required fiscally is a number that will distinguish a job order from all other job orders at the activity and provide an index to the job order itself or to the master card that contains all of the detailed accounting information. Therefore, the number will include in its structure a serial number that by itself or in combination with other codes in the number will satisfy fiscal needs.” (See table 9-3.)

Table 9-2.—Priority Matrix

		WORK CLASSIFICATIONS			
		SAFETY	FUNCTIONAL	PREVENTIVE	APPEARANCE
IMPORTANCE LEVEL	HIGH	2	3	4	6
	ROUTINE	3	5	7	8
	LOW	6	7	9	10

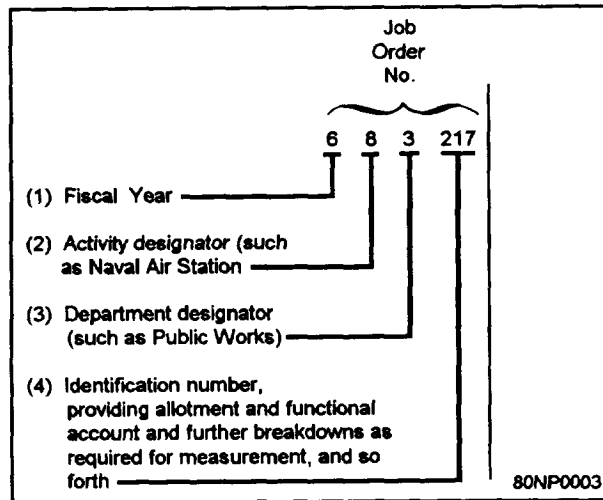
EMERGENCY OR EXCEPTIONAL TOP PRIORITY  
1

80NP0002

## Master Job Orders for Housing

When collecting costs by functional accounts or group classification of work (for example, certain types of quarters for which the *Navy Family Housing Manual*, NAVFAC P-930, sets spending limitations), the reduction of some job order paperwork to a single master job order is possible. This job order will cover several functional accounts performed simultaneously or all the work described on the same work request or inspection report. For example, all the work shown in table 9-4 normally written as seven separate job orders, are combined into one job order as follows:

**Table 9-3.—Makeup of Job Order Number**



**Table 9-4.—Identification of Job Orders**

No.	80NP0004 Work	Functional Account	Group Classification	Group Code
1	Paint	44551	2b	22
2	Repair roof	44551	2a	21
3	Replace garage door	44573	3d	34
4	Repair sidewalk	44761	3c	33
5	Trim shrubs	44790	3b	32
6	Repair furniture	44120	6a(1)	61
7	Repair boiler	44688	6b(1)	64

1. Issue one master job order classification identification (group code) in the master job order number.

2. Then draw an additional column (fig. 9-5) on the job order so you can enter the two-digit group code (table 9-4) opposite each item of work (table 9-5).

### Labor Class Codes

Labor class codes are two-digit figures that represent various categories of overhead and productive work.

Code all man-hour expenditures for a Maintenance and Utilities Branch by labor class, despite the funding source. This is shown in the Tabulated Report A and the Maintenance/Utilities Labor Control Report, NAVFAC 9-11014/29. Assign labor class codes according to the productive work-class performed or

overhead charged, rather than by the funding source. The following labor class codes are standard:

1. Productive. The following labor class codes are productive labor:

- 01 service work
- 02 emergency work
- 03 preventive maintenance inspection
- 04 standing job orders—not estimated
- 05 standing job orders—estimated
- 06 minor work authorizations
- 07 specific job orders

2. Overhead. The following codes are overhead:

- 40 rework
- 41 supervision
- 42 shop indirect
- 43 allowed time
- 44 general office and clerical
- 45 leave

Record the labor class code on the Daily Time and Labor Distribution Card. You must enter the labor class code each time you place a job order number or a shop control number on the time cards.

### Division and Branch Codes

Because of variation in the types of work performed, work center code standardization is not practical. However, it is practical and desirable to have branch code standardization to help cost accounting procedures. Table 9-6 groupings show branch code standardization.

Sometimes the number of personnel assigned to various crafts may not justify the official designation of separate work centers. However, you may use alphabetical subdivisions as an aid in work programming and scheduling. Subdivide work center codes as shown in table 9-7.

### PLANNING AND ESTIMATING

The planner and estimator holds a key position in the Shore Facilities Maintenance System. His person is responsible for planning technical jobs and estimating the number of man-hours needed to complete the maintenance work.

WORK AUTHORIZATION/ESTIMATE (MAINTENANCE MANAGEMENT)										3. JOB ORDER NO.	
NAVYAC 1181A/82 (15-FG) 100001-1001-1001 Superseding NAVDOCS 2001 and 2002										2804--22	
1. ACTIVITY U.S. Naval Station					2. ACTIVITY CODE 00188			4. ESTIMATE NO. 50-002-93			
6. REQUESTED STARTING DATE 12/93		8. PRIORITY 3		7. INSPECTION GENERATED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		9. FACILITY NO. 14		5. EQUIPMENT NO. 425			
10. APPLICATION CODE 44110		11. COST ACCOUNT CODE 7140		12.		13.		14.			
II. NAVY ACCOUNTING DATA											
6. APPROPRIATION SYMBOL AND SUBHEAD 17X4912.1993		8. OBJECT CLASS 25	7. BUREAU CONTROL NUMBER 77777		4. AUTH. ACCOUNTING ACTIVITY 00188		5. TRANS CODE 2F		1. PROPERTY ACCTG. ACTIVITY 00188		
16. FOR FURTHER INFORMATION CALL (Name and telephone) Jim Jones 69148					17. BRETCHPLAN ATTACHED IF YES INDICATE NUMBER <input checked="" type="checkbox"/> YES 123456 <input type="checkbox"/> NO			18. LABOR CLASS CODE (Change for overhaul) 07			
19. JOB TITLE Change of occupancy rehab.											
20. GENERAL JOB DESCRIPTION Change of occupancy rehab.-- Quarters A must be completed by 28 Jan 1994.											
21. ESTIMATE											
a. BREAKDOWN OF WORK					b. SUMMARY OF ESTIMATE						
JOB PHASE NO (1)	WORK CENTER (2)	Group Code (3)	DESCRIPTION (4)	EST. HOURS (5)	WORK CENTER (6)	LABOR HOURS (7)	LABOR (8)	MATERIAL (9)	TOTAL ESTIMATE (10)		
	02	22	Paint interior	150*	02	180*	540	170	710		
	02	22	Paint exterior	30*	01R	15*	45	55	100		
	01R	21	Repair roof	5*	34	5*	15	15	30		
	01	34	Replace garage door	10*	32	40	80	0	80		
	34	33	Repair sidewalk	5*	01F	5*	15	55	70		
	32	32	Trim shrubbery	40	51	5	16	5	21		
	01F	61	Repair furniture	5*							
	51	64	Repair boiler	5							
22. DISTRIBUTION					TOTAL	250*	711	300	1011		
MCD	2	Sched	2		a. CONTINGENCY						
ADP	1				d. OVERHEAD AND/OR SURCHARGE						
MAINT	6				e. GRAND TOTAL					1011	
23. AUTHORIZED WORK TO BE PERFORMED (Signature) H. Betz					TITLE MCD			DATE 10/12/93			

86NP0007

Figure 9-5.—Job order for multiple expenditure accounts (housing).

Table 9-5.—Job order structure (Housing)

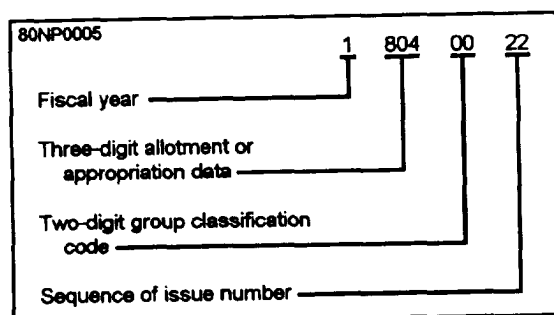


Table 9-6.—Branch Code Standardization

Codes 00 - 49	Maintenance Division
Codes 50 - 59	Utilities Division
Codes 90 - 99	Office Divisions
	- Administrative
	- Maintenance Control
	- Engineering
	- Housing
Maintenance Division	
Building Trade Branch.....	00
Metal Trade Branch.....	10
Electrical Trade Branch.....	20
General Service Branch.....	30
Administrative Branch - Maintenance Division.....	45
Utilities Division	
Administrative Branch.....	50
Generation Branch.....	51
Distribution Branch.....	52
Office Divisions	
Administrative.....	90
Maintenance Control.....	91
Engineering.....	92
Housing.....	95

80NP0006

The estimator defines the scope of a project by specifying the work to be accomplished and the skills required. To help the estimator in this job, the Navy has developed Engineered Performance Standards (EPSs). The EPSs give estimates of the time needed to complete the particular craft phases of a job. You will find a complete description of EPSs in the NAVFAC P-700 series. Since these standards save time and usually provide more reliable estimates than individual

Table 9-7.—Work Center Subdivision

Building Trade Branch.....	00
Carpentry.....	01
Carpenters.....	01C
Millmen.....	01M
Roofers.....	01R
Painting.....	02
Wharf Builders.....	03
Masonry.....	04
Rigging.....	05
Metal Trade Branch.....	10
Plumbing & Pipefitting.....	11
Plumbing.....	11P
Pipe & Steam Fitting.....	11S
Welding.....	12
Sheet Metal.....	13
Electrical Trade Branch.....	20
Electrical - Inside.....	21
Electrical - Linemen.....	22
Refrigeration & Air Conditioning.....	23
General Service Branch.....	30
Janitorial.....	31
Grounds - Labor.....	32
Refuse & Trash Collection.....	33
Ground Structures - Labor.....	34
Etc. ....	
Emergency / Service Branch.....	40
(Becomes work center at small activities)	
*Administrative Branch - Maintenance Division.....	45

\*Should include all clerical personnel of the Maintenance Division and all supervisors and shop planners associated with more than one work center.

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judgment, the estimators should use them. When an engineered design is needed, the Engineering Branch provides it to the estimator. No types of estimates are used; each conforms to a particular need.

## SCOPING ESTIMATE

Typically, it is helpful for management to get an estimate of job costs before assigning a job priority. The formal planning and estimating process can provide this, but only at significant expense. Since a ball park estimate is normally adequate, NAVFAC has encouraged the use of the scoping estimate—a rough, quick estimate of costs. The scoping estimate is particularly useful when you deal with reimbursable customers. You can inform them of the approximate job costs and ask if they wish to go on with the work. Unit Price Standards, NAVFAC P-716.0, should be used when preparing scoping estimates.

## **FINAL ESTIMATE**

Do not authorize a final estimate until the job is approved. This type of estimate shows all the work operations listed on the job plan and considers the analysis of work operations in detail. Final estimates should be the most accurate forecast possible of the costs, man-hours, and material requirements for a given job. Make every effort to provide a final estimate within a reasonable time.

After planning and estimating the job, formalize it as a job order by assigning a job order number and completing the accounting data. The job is ready for scheduling (first into a specific month, then into a specific week) for completion by the Maintenance Branch.

## **WORK INPUT CONTROL AND SCHEDULING**

To assure completion of authorized work efficiently, you must set up some means of control. To help in the orderly flow and completion of work, you need to use work input control and scheduling procedures. These procedures require you to use several forms and charts.

### **WORK INPUT CONTROL**

Work input control is a formalized means of managing the total PWD work load. It also serves as a centralized source of work status information by using the Job Requirements and Status Chart, the Manpower Availability Summary, and the Work Plan Summary.

#### **Job Requirements and Status Chart**

The Job Requirements and Status Chart, as shown in figure 9-6, provides a ready reference for tracking all the specific and minor jobs established as known maintenance requirements. The chart includes all customer-financed individual jobs and minor construction, alteration, and improvement type of work. In addition, this chart provides information on proposed planning to determine the status of work not programmed for shop accomplishment. You should enter all new work, upon approval, on this chart. The entry should remain until the authorization of work for shop accomplishment, canceled, or completed by contract. You can maintain a different Job Requirement and Status Chart for each major type of work, such as

alterations and minor construction, customer work, and maintenance and repair.

### **Manpower Availability Summary and Work Plan Summary**

The Manpower Availability Summary and Work Plan Summary (fig. 9-7) show the plan of the department for using the Maintenance or Utilities Branch work force. By breaking down the Work Plan Summary by funding sources, you see that the summary also shows a payroll support plan.

Before formulating and adjusting the monthly shop work load, the job order programmer must know the man-hours available for programming within each work center. When customer funds provide significant support to the PWD, the programmer must know the number of man-hours allotted to each funding source. To decide this information, the programmer should develop a Manpower Availability Summary and a Work Plan Summary for each month.

### **Monthly Shop Load Plan**

The work control method used within the maintenance management system is the Shop Load Plan (fig. 9-8). The Shop Load Plan is the Public Works management plan for using shop forces on specific job orders for a given month. This monthly plan provides the shop planner with direction on what jobs to schedule within the month. All levels of management from the shops divisions up to the PWO participate in its preparation.

Express the Shop Load Plan by the obligation of the known available man-hours for each work center and for each job scheduled. The Shop Load Plan consists of sections for short-range and long-range planning. The short-range plan covers the nearest 3 months, and the long-range plan covers the following 9 months. The suggested loading for the short-term plan is 100 percent for the first month, 90 percent for the second month, and 80 percent for the third month. Jobs that appear on the Shop Load Plan become the shop backlog. For maximum productivity, you should always try to have a 3- to 6-month backlog to balance the work that goes to the shops.

## **SHOP SCHEDULING**

Shop scheduling takes place in a two-stage scheduling system: master scheduling of specific job orders weekly and work center scheduling of specific



MANPOWER AVAILABILITY SUMMARY																				MONTH _____	
BRANCH NAME																				TOTAL ALL WORK CENTERS	
WORK CENTER AND JOR SHOP CODE																				MEN OR HOURS	
WORK CENTER AND JOR SHOP NAME																				%	
NUMBER OF PERSONNEL	CURRENT MONTH ON BOARD COUNT	FROM OFFICIAL RECORDS OF ONEBOARD COUNT																			
	PLANNED ADJUSTMENTS	KNOWN RETIREMENTS, RIFS, TEMPORARY HIRES, LABOR TO BE BORROWED (OTHER THAN BETWEEN																			
	AVERAGE AVAILABLE PERSONNEL	BETWEEN BRANCHES)																			
AVERAGE AVAILABLE MAN-HOURS																					
INDIRECT AND OVERHEAD MAN-HOURS	REWORK																				
	SUPERVISION																				
	SHOP INDIRECT	BASED ON HISTORICAL DATA - TRENDS - MODIFIED BY																			
	ALLOWED TIME	ANTICIPATED CHANGES OF MANAGEMENT ACTION																			
	GENERAL OFFICE AND CLERICAL																				
LEAVE		ANNUAL LEAVE CAN BE CONTROLLED ON MONTHLY BASIS																			
TOTAL PLANNED INDIRECT & OVERHEAD MAN-HOURS																					
WORK PLAN SUMMARY																				"PLANNED" FIGURES	
LABOR DESCRIPTION		PLANNED PRODUCTIVE LABOR IN MAN-HOURS																		FOR LABOR CONTROL REPORT	
SERVICE WORK		BASED ON TRENDS AND SHOP BACKLOG																		DIRECTOR, UTIL.	
EMERGENCY WORK																				DIRECTOR, TRANS. DIV.	
PREVENTIVE MAINTENANCE INSPECTION (PMI)		BASED ON PM SCHEDULE																		AS APPROPRIATE	
STANDING JOB ORDERS UNESTIMATED		BASED ON HISTORY - MODIFIED BY MANAGEMENT ACTION																		SUBJECT TO APPROVAL	
STANDING JOB ORDERS ESTIMATED		FROM ACTUAL REQUIREMENTS FOR MONTH																		OF	
MINOR WORK		BASED ON TRENDS AND SHOP BACKLOG																		PWO / ASST. PWO	
SPECIFIC JOB ORDERS		BALANCE LEFT AFTER ALLOCATIONS TO OTHER CATEGORIES IF INSUFFICIENT - REVISE ALLOCATIONS TO OTHER CATEGORIES. THIS IS THE PLANNING FIGURE FOR SHOP LOAD PLAN																			
TOTAL PLANNED PRODUCTIVE LABOR IN MAN-HOURS																					
TOTAL PLANNED MAN-HOURS (INDIRECT, OVERHEAD AND PRODUCTIVE LABOR)																					
INCLUDE TRANSPORTATION DIVISION AVAILABILITY FOR SPECIFICS ONLY																					
MAINTENANCE WORK INPUT CONTROL																					

80NP0009

Figure 9-7.—Manpower Availability Summary and Work Plan Summary.



SHOP LOAD PLAN															PERIOD PLANNED PAGE ____ OF ____ PAGES								
SPECIFIC WORK			PLANNED PRODUCTIVE LABOR IN MAN-HOURS												ESTIMATED COST-TOTAL JOB				REMARKS				
JOB ORDER NO.	JOB DESCRIPTION	F C C	PLAN MED START DATE	SCHEDULES START DATE	FINISH DATE	W.C. CODE	W.C. NAME	10	11	12	13	14	15	16	17	18	19	20		21	22	23	24
FROM JOB REQUIREMENTS AND STATUS CHART			FROM NAVFAC 11014/23 - JOB PHASE CALCULATION SHEET												USE ROUGH ESTIMATE ON LONG-RANGE PLAN								
			WEEKLY FEEDBACK FROM MASTER SCHEDULE																				
			USED ONLY FOR COMMITTED STARTING DATES																				
			USED BY PWO/ASST PWO IN DECIDING WHICH JOBS TO BE DEFERRED WHEN INTRODUCING NEW URGENT JOBS DURING CURRENT MONTH																				
			BALANCE WORK CENTER TOTALS WITH WORK CENTER CAPABILITY ON SPECIFIC JOB ORDERS ON MANPOWER AVAILABILITY CHART																				

MAINTENANCE WORK INPUT CONTROL

80NP0010

Figure 9-8.—Shop Load Plan.

and minor work. Master scheduling connects specific jobs to each work center for accomplishment during the following week. Work center scheduling takes up where master scheduling leaves off. The work center supervisor breaks down the weekly assignments into daily assignments for the workers in the shop. After making the daily assignments on specific job orders, the work center supervisor assigns work to the remaining uncommitted shop forces.

The shop planner/scheduler, by using the Shop Load Plan of the coming month, consults with the proper shop supervisor to schedule the work for the coming weeks. The man-hours scheduled should be consistent with the available man-hours identified for specific job order work on the Manpower Availability Summary and Work Plan Summary.

Weekly, compare the master schedule with the actual man-hours expended of the work center to find out if jobs meet the estimate of the master schedule. If a job is off schedule, adjust the work center schedule of the following week without making major changes to the master schedule.

The shop supervisor reviews the master schedule and prepares the work center schedule each week. He or she reviews it daily to ensure the maximum use of shop resources. The shop supervisor coordinates with other shops when a requirement for more than one craft exists.

Shop scheduling is required throughout the job when the shop performs at various stages of the work. For example, the carpenters would open an area to allow the plumbers to make a repair. The carpenters would then close the area after the repair with the painters arriving later for final touches. To schedule the job properly, it would be necessary to divide the carpenters' time between two distinct work phases. You must make sure all the plumbing repairs are done before the carpenters' return to the work place. Do not schedule the painters until all the other workers have finished their assignments.

## **MANAGEMENT REPORTING**

Any management system requires management reporting in some form. You compile management reports from data available within the system. These reports provide aperiodic status review for determining if there is a requirement for special management action. Maintenance management reports provide performance and manpower distribution information. You can

identify historical trends that can aid you in planning future work force requirements. The three types of reports used by PWDs are the Tabulated Report A, the Maintenance/Utilities Labor Control Report, and the Tabulated Report B.

### **TABULATED REPORT A**

The Tabulated Report A is a monthly report (fig. 9-9). It provides information on labor hours expended in the various work categories for each Maintenance and Utilities Branch work center and branch. The activity comptroller prepares Tabulated Report A. The report is due within ten working days after the last day of the period reported. This report provides basic feeder data to the Maintenance/Utilities Labor Control Report. The data on this report comes from personnel time cards.

### **MAINTENANCE/UTILITIES LABOR CONTROL REPORT**

The monthly Maintenance/Utilities Labor Control Report, NAVFAC Form 9-11014/29 (fig. 9-10), provides data on what was planned, the actual results, and any variances from the plan. It also provides a summary of the man-hours expended on each labor class code. This report permits management to forecast manpower requirements realistically for the various work categories. The report helps in the preparation of the Manpower Availability Summary and the Work Plan Summary. It enables management to decide if the need to issue fully controlled work is increasing or decreasing. The goal is the maximum use of planned, estimated, scheduled, and cost-accounted work. An increased use of unestimated standing job orders and E/S work could show a reduced effectiveness of the maintenance management system. Preparation and distribution of the Maintenance/Utilities Labor Control Report by the management analysis branch occurs within five working days after the receipt of Tabulated Report A.

### **TABULATED REPORT B**

Activities, having less than a 100-man Maintenance and Utilities Branch and do not have full accounting potential, are encouraged to use Tabulated Report B (Completed Job Orders).

This report normally is prepared either weekly or biweekly. Tabulated Report B (fig. 9-11) compares actual and estimated labor hours, labor costs, and

PUBLIC WORKS DEPARTMENT TABULATED REPORT A - FEEDER FOR MAINTENANCE/UTILITIES DIVISIONS LABOR CONTROL REPORT			
Work Center	Labor Class Code	Actual Labor Hours - Month	Actual Labor Hours - Fiscal Year-To Date
11	01	1474.9	638.2
	02	1433.4	397.7
	03	115.0	1438.9
	04	89.6	752.6
	05	218.7	1988.0
	06	175.3	1942.5
	07	788.2	8984.4
		1485.1	16122.3
	40	5.5	51.2
	41	152.0	1820.0
	42	89.6	762.1
	43	58.0	531.0
	44		
	45	178.0	1982.0
		483.1	5116.3
		1948.2	21238.0
12	01	79.0	831.2
	02	16.0	194.6
	03	81.0	754.2
	04		215.6
	05	495.0	5318.1
	06	51.8	435.2
	07	115.0	1630.2
		837.8	8380.1
	40		31.2
	41	120.0	1432.0
	42	94.6	756.0
	43	45.0	421.6
	44		
	45	129.0	1536.0
		398.6	4177.0
		1228.2	13657.1
Branch (A) Summary	01	153.9	1498.4
	02	49.4	592.3
	03	198.0	2193.1
	04	59.6	988.2
	05	713.7	7308.1
	06	228.9	2378.7
	07	903.2	10564.6
		2302.7	25502.4
	40	5.5	82.4
	41	272.0	3252.0
	42	184.2	1508.1
	43	103.0	952.8
	44		
	45	307.0	3448.6
Maintenance Division Summary	01	389.0	3241.0
	02	218.8	2002.1
	03	594.0	6634.0
	04	421.0	4437.2
	05	2431.6	26333.2
	06	1898.4	2070.4
	07	6945.2	73631.8
		12875.6	11664.9
	40	27.8	115.2
	41	824.5	7211.4
	42	231.2	1974.8
	43	189.6	1438.0
	44	160.0	1537.0
	45	1452.0	16536.2
		2885.1	30812.6
		15580.9	47482.1
Utilities Division Summary	01	79.0	833.2
	02	38.2	311.7
	03	104.6	1312.2
	45	738.0	8334.0
	46	1279.3	13321.8
		7341.8	67519.2

Figure 9-9.—Tabulated Report A.

material costs broken down by the work centers for each completed or canceled job order.

The completed job order report with comments on the completed job order document from the shops enables management to determine if major problems are

present. Common problems are poor estimating, low productivity, and poor supervision. If variations are consistently large, management should act to correct the factors that are causing the problems. Future reports and observations show whether the corrective action has been successful or not.

1. <b>U.S. NAVAL STATION, BAYVIEW</b>						2. <input checked="" type="checkbox"/> MAINTENANCE DIVISION <input type="checkbox"/> UTILITIES DIVISION				
3. <b>U.S. NAVAL STATION, BAYVIEW</b>						4. TOTAL PERSONNEL <b>328</b>				
5. PERIOD (From-To) <b>1-30 April 1994</b>						6. SUMMARY REPORT <input checked="" type="checkbox"/> BRANCH REPORT <input type="checkbox"/>				
6. LINE ITEM	7. LABOR CLASS CODE	8. CONTROL ELEMENT	9. CURRENT MONTH MAN-HOURS			10. YEAR-TO-DATE MAN-HOURS				11. ACCEPTABLE RANGE
			a. PLANNED	b. ACTUAL	c. VARIANCE	a. PLANNED	b. ACTUAL	c. VARIANCE	d. % DIST	
1	40	REWORK	0	0	0	0	0	0	0	0.3 - 0.4%
2	41	SUPERVISION	2350	2094	-256	26590	23470	-3120	4.5	6 - 7.8%
3	42	SHOP INDIRECT	1600	1532	-68	16750	16671	-79	3.2	5 - 6%
4	43	ALLOWED TIME	1810	1303	-507	18586	16575	-2010	3.2	2 - 3%
5	44	GENERAL OFFICE & CLERICAL	704	671	-33	8244	7605	-639	1.5	1.5 - 2.5%
6	45	LEAVE	10640	10555	-85	60555	6023	-1832	129	14 - 18%
7										
8										
9	TOTAL	INDIRECT AND OVERHEAD MAN-HOURS	17104	1455	-949	118924	131244	-7680	263	28 - 32%
10	01	SERVICE	6700	5937	-763	67990	62718	-5272	121	6 - 9%
11	02	EMERGENCY WORK	2900	2495	-405	30395	29157	-1238	5.6	1.5 - 2.5%
12	03	DYNAMIC EQUIPMENT INSPECTION EQUIPMENT	106	157	57	4110	3866	-244	0.7	1.5 - 3%
13	04	STANDING JOB ORDERS NOT ESTIMATED	2885	3110	225	37410	32402	-5008	6.2	
14	05	STANDING JOB ORDERS ESTIMATED	3500	3917	417	46280	4129	-5621	7.9	
15	06	MINOR WORK	5980	4649	-1331	66294	52995	-13299	10.2	
16	07	SPECIFIC JOB ORDERS	18551	14533	-4018	20143	165396	-42299	31.9	
17										
18										
19	TOTAL	PRODUCTIVE MAN-HOURS	40624	34798	-5826	460642	38764	-72981	74.1	68 - 72%
20	GRAND TOTAL MAN-HOURS		57728	50953	-6775	599566	518905	-80661		
21	PRODUCTIVE EFFORT (Line 19 Line 20)		70.4 %	68.3 %		76.8 %	74.7 %			68 - 72%
22	LABOR PERFORMANCE - EPS <sup>1</sup>			96 %			103 %			95 - 105%
23	LABOR PERFORMANCE - NON-EPS <sup>2</sup>			108 %			101 %			95 - 105%
24	PRODUCTIVE MAN-HOUR CONTROL (Line 19 - 14 - 15 - 16 Line 19)		69.3 %	66.8 %		70.5 %	67.9 %			80 - 85%
			18139	23256		324041	283384			

86NP0008

Figure 9-10.—Maintenance/Utilities Labor Control Report NAVFAC Form 9-11-14/29.

## ENERGY MANAGEMENT

During this cost-conscious age, the Navy is looking for ways to reduce dependency on petroleum products and reduce costs for energy. When performing the various inspections, you should look for ways to improve energy usage.

Energy management is not just replacing or removing light bulbs. You must look at all the aspects of your energy usage for each facility. As equipment is improved throughout

the world, better and more efficient equipment is made available. Guidelines have been established for usage reduction throughout DoD. These reductions can be accomplished by equipment upgrade as well as energy conservation.

Special funding is available through NAVFAC and the Navy for projects involving energy usage reduction. These projects could include items, such as replacing lighting fixtures in facilities, replacing the doors and

PUBLIC WORKS DEPARTMENT TABULATED REPORT B - COMPLETED JOB ORDERS										
Trade Branch or Work Center	Job Order Number	Estimated Hours	Actual Hours	Estimated Labor Cost	Actual Labor Cost	Estimated Material Cost	Actual Material Cost	Estimated Total Cost	Actual Total Cost	Variation Total Cost
12	7212010	7	8.5	16	18.45	5	5.05	21	23.50	2.50
24	7212010	32	39.8	67	82.72	21	20.15	88	102.87	16.57
33	7212010	16	14.9	32	30.15	12	11.15	44	41.30	2.70
41	7212010	8	8.0	13	12.96			13	12.96	.04
		63	71.2	128	146.28	38	36.35	166	180.63	17.93
14	7242032	252	252.0	529	529.20	346	351.27	875	880.47	5.47
23	7242032	48	52.3	100	108.26	30	27.12	130	135.38	11.14
32	7242032	12	12.1	25	25.25	4	3.65	29	28.90	.60
42	7242032	188	188.3	305	305.09	7	30.83	312	335.92	23.92
		500	504.7	959	967.80	387	412.87	1346	1380.67	34.67
13	7272036	24	22.0	50	45.76	23	21.05	73	66.81	6.19
14	7272036	24	27.7	48	56.28	14	13.85	62	70.13	8.43
51	7272036	16	17.1	33	35.19	10	9.16	43	44.35	3.03
		64	66.8	131	137.23	47	44.06	175	181.29	9.17
12	7272062	265	283.5	548	586.85	187	172.25	735	759.10	53.60
33	7272062	79	74.3	161	150.75	65	59.95	226	210.70	15.30
41	7272062	61	110.1	125	225.72	30	49.33	155	275.05	120.05
		405	467.9	834	963.32	282	281.53	1116	1244.85	129.79
10	TRADE BRANCH A	780	758.2	1870	1819.68	1045	1078.73	2915	2898.41	84.05
20	TRADE BRANCH B	1650	1631.7	4290	4242.42	2580	2231.95	6870	6474.37	395.63
30	TRADE BRANCH C	1324	1280.0	3310	3200.00	1895	2017.51	5205	5217.51	232.51
40	TRADE BRANCH D	942	959.6	1885	1918.00	950	943.75	2835	2861.75	39.25
50	TRADE BRANCH E	631	652.0	1580	1630.00	870	891.15	2450	2521.15	71.15
	MAINT. DIV. SUMMARY	4696	4628.9	11355	11180.10	6470	6271.94	17825	17452.04	372.96
	UTIL. DIV. SUMMARY	631	652.0	1580	1630.00	870	891.15	2456	2521.15	71.15

NOTE: "cents" and decimal hours may be eliminated, if desired.

80NP0012

Figure 9-11.—Tabulated Report B (Completed Job Orders).

windows in many of the older facilities, or replacing entire HVAC systems. You should work closely with the PWO and the FME in determining the cost payback

of the modifications and energy reductions. Energy management is as much a part of facilities maintenance as inspections.

